M/049/031

NOTICE OF INTENTION TO COMMENCE LARGE MINING OPERATIONS

Lehi Quarry
Cedar Fort Road, Lehi, Utah County

DOGM Received
Oct. 28, 1997

Submitted by:
VALLEY ASPHALT, INC.
7434 SOUTH DEL MONTE ROAD
SPANISH FORK, UTAH 84660
(801) 798-1152

Prepared by:
WISER COMPANY, LLC
1431 KENSINGTON SQUARE COURT
MURFREESBORO, TENNESSEE 37130
(615) 896-7375

Contents

DRAFT

FORM MR-LMO
(Revised 4/97)

FOR DIVISION USE ONLY
File #: M / /
Date Received: / /
DOGM Lead:

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING
1594 West North Temple Suite 1210
Box 145801
Salt Lake City, Utah 84114-5801
Telephone: (801) 538-5291
Fax: (801) 359-3940

NOTICE OF INTENTION TO COMMENCE LARGE MINING OPERATIONS

The informational requirements in this form are based on provisions of the Mined Land Reclamation Act, Title 40-8, Utah Code Annotated 1953, General Rules and Rules of Practice and Procedures.

This form applies only to mining operations which disturb or will disturb more than five acres at any given time.

"MINING OPERATIONS" means those activities conducted on the surface of the land for the exploration for, development of, or extraction of a mineral deposit, including, but not limited to, surface mining and the surface effects of underground and in situ mining, on-site transportation, concentrating, milling, evaporation, and other primary processing.

"Mining operation" does not include: the extraction of sand, gravel, and rock aggregate; the extraction of oil and gas as defined in Chapter 6, Title 40; the extraction of geothermal steam; smelting or refining operations; off-site operations and transportation; or reconnaissance activities which will not cause significant surface resource disturbance or involve the use of mechanized earth-moving equipment such as bulldozers or backhoes.

PLEASE NOTE: *This form is to be used as a guideline in assembling the information necessary to satisfy the Large Mining Operations Notice of Intention requirements. You will need extra space to provide a majority of the information requested. Please provide the information on additional sheets and include cross-referenced page numbers as necessary. The operator may submit this information on an alternate form; however, the same or similar format must be used.*

DRAFT

I. Rule R647-4-104 - Operator(s), Surface and Mineral Owners

The operator must provide the name, address and telephone number of the individual or company who will be responsible for the proposed operation. If a company is to be listed as the operator, then the name of the corporate officers need to be provided.

1. Mine Name: Lehi Quarry

2. Name of Applicant or Company: Valley Asphalt, Inc.
   Corporation (X) Partnership ( ) Individual ( )

3. Permanent Address: 7434 South Del Monte Road
   Spanish Fork, Utah 84660

4. Company Representative (or designated operator):

   Name: Brent Sumsion
   Title: President
   Address: 7434 South Del Monte Road, Spanish Fork, Utah 84660
   Phone: (801) 798-1152

5. Location of Operation:
   County(ies) Utah
   _____ 1/4 of NW 1/4, Section: 16 Township: 5 S Range: 1 W
   _____ 1/4 of _____ 1/4, Section: _____ Township: _____ Range: _____
   _____ 1/4 of _____ 1/4, Section: _____ Township: _____ Range: _____

The names of the surface and mineral owners for any areas which are to be impacted by mining must be provided to the Division, This list should include all private, state and federal ownership and the owners of lands immediately adjacent to the project areas.

6. Ownership of the land surface (circle all that apply): Private (Fee), Public Domain (BLM), National Forest (USFS), State of Utah or other:

   Name: _____ Address: _____
   Name: _____ Address: _____
   Name: _____ Address: _____
   Name: _____ Address: _____

7. Owner(s) of record of the minerals to be mined:

   Name: State Trust Land/School Address: _____
   Name: _____ Address: _____
   Name: _____ Address: _____
   Name: _____ Address: _____

8. Have the above owners been notified in writing? Yes __X__ No _____

If no, why not? _____

_____

9. Does the operator have legal right to enter and conduct mining operations on the land covered by this notice? Yes ___X___ No _____.

II. Rule R647-4-105 - Maps, Drawings & Photographs

105.1 - Base Map

A complete and correct topographic base map (or maps) with appropriate contour intervals must be submitted with this notice showing all of the items on the following checklist. The scale should be approximately 1 inch = 2,000 feet (preferably a USGS 7.5 minute series or equivalent topographic map where available). The map(s) must show the location of lands to be affected in sufficient detail to allow measurement of the proposed area of surface disturbance.

Base Map Checklist

Please check off each section to verify these features are included on the map(s) or explain why it is not applicable.

			Map #
_____	(a)	Property boundaries of surface ownership of all lands which are to be affected by the mining operations;	_____
_____	(b)	Perennial, intermittent, or ephemeral streams, springs and other bodies of water; roads, buildings, landing strips, electrical transmission lines, water wells, oil and gas pipelines, existing wells or boreholes, or other existing surface or subsurface facilities within 500 feet of the proposed mining operations;	_____
_____	©	Proposed route of access to the mining operations from nearest publicly maintained highway (Map scale appropriate to show access);	_____
N/A	(d)	Known areas which have been previously impacted by mining or exploration activities within the proposed land affected;	_____
_____	(e)	Areas proposed to be disturbed or reclaimed over the life of the project or other suitable time period.	_____

105.2 - Surface Facilities Map

Surface Facilities Map Checklist

Surface facilities maps should be provided at a scale of not less than 1" = 500'.

Please check off each section to verify these features are included on the map(s) or explain why it is not applicable.

DRAFT

Map #

X (a) Proposed surface facilities, including but not limited to: buildings, stationary mining/processing equipment, roads, utilities, power lines, proposed drainage control structures, and the location of topsoil storage areas, overburden/waste dumps, tailings or processed waste facilities, disposal areas for overburden, solid and liquid wastes, and wastewater discharge treatment and containment facilities; 1

X (b) A border clearly outlining the extent of the surface area proposed to be affected by mining operations, and the number of acres proposed to be affected; 1

____ © The location of known test borings, pits, or core holes. Only two test borings were performed. These are addressed in the attached addendum. ____

105.3 - Additional Maps

Reclamation Treatments Map Checklist

Please check off each section to verify these features are included on the map(s) or explain why it is not applicable.

Map #

X (a) Areas of the site to receive various reclamation treatments shaded, cross hatched or color coded to identify which reclamation treatments will be applied. Areas would include: buildings, stationary mining/processing equipment, roads, utilities, proposed drainage improvements or reconstruction, and sediment control structures, topsoil storage areas, waste dumps, tailings or processed waste facilities, disposal areas for overburden, solid and liquid wastes, ponds, and wastewater discharge, treatment and containment facilities. Reclamation treatments may include ripping, regrading, replacing soil, fertilizing, mulching, broadcast seeding, drill seeding, and hydroseeding: 1

X (b) A border clearly outlining the extent of the area to be reclaimed after mining, the number of acres disturbed, and the number of acres proposed for reclamation: 1

X © Areas disturbed by this operation which are included in a request for a variance from the reclamation standards: 1

X (d) Highwalls which are proposed to remain steeper than 45 degrees and slopes which are proposed to remain steeper than 3 horizontal:1vertical.

Note: By shading or other means areas included in sections c & d will need to be referenced in the variance request section.

DRAFT

Additional maps and cross sections may be required in accordance with Rule R647-4-105.3. Design drawings and typical cross-sections for each tailings pond, sediment pond, or other major drainage control structures must also be included.

III. Rule R647-4-106 - Operation Plan

106.1 - Mineral(s) to be mined: Limestone

106.2 - Type of Operation Conducted:

Describe the typical methods and procedures to be used in mining operations, on-site processing and concurrent reclamation. Include equipment descriptions where appropriate.
See attached addendum.

106.3 - Estimated Acreage

Acreage listed here should match areas measured off the maps provided.

Areas of actual mining:	95.78 acres
Overburden/waste dumps:	
Ore and product stockpiles:	Included in on-site processing
Access/haul roads	0.53
Associated on-site processing facilities:	16.0
Tailings disposal:	
Other - Please describe	31.96
Total Acreage	144.27

106.4 - Nature of material including waste rock/overburden and estimated tonnage

Describe the typical annual amount of the ore and waste rock/overburden to be generated, in cubic yards. Where does the waste material originate? What is the nature of the overburden/wastes (general chemistry/mineralogy and description of geologic origin)? Will it be in the form of fines or coarse material? What are the typical particle size and size fractions of the waste rock? See attached addendum.

Thickness of overburden:	0 ft.
Thickness of mineral deposit:	400 ft.
Estimated annual volume of overburden:	0 cu. yds.
Estimated annual volume of tailings/reject materials:	0 cu. yds.
Estimated annual volume of ore mined:	600,000 cu. yds.

Overburden/waste description: Overburden material is not anticipated. Waste material, if any, will not remain on site.

106.5 - Existing soil types, location of plant growth material

Specific information on existing soils to be disturbed by mining will be required. General soils information may not be sufficient. See attached Exhibit C.

Provide specific descriptions of the existing soil resources found in the area. Soil types should be identified along with depth and extent, especially those to be directly impacted by mining.

Soils - The plan shall include an order 3 Soil Survey (or similar) and map. This information is needed to determine which soils are suitable for stockpiling for revegetation. This soil data may be available from the local Soil Conservation Service office, or if on public lands, from the land management agency. The map needs to be of such scale that soil types can be accurately determined on the ground (see Attachment I). See attached Exhibit C.

(a) Each soil type to be disturbed needs to be field analyzed for the following:

Depth of soil material	12 to 24 inches
Volume (for stockpiling)	271,790 cu. yds.
Texture (field determination	
pH (field determination)	Soils test pending
(cross reference with item 106.6)	

(b) Where there are problem soil areas (as determined from the field examination) laboratory analysis may be necessary. Soil samples to be sent to the laboratory for analysis need to be about one quart in size, properly labeled, and in plastic bags. Each of the soil horizons on some sites may need to be sampled. Soil sample locations need to be shown on the soils map. Soil analysis for these samples should include: texture, pH, Ec (conductivity), CEC (Catoin Exchange Capacity), SAR, % Organic Matter, Total N, Available Phosphorus (as P_2O_5), Potassium (as K_2O), and acid/base potential.

106.6 - Plan for protecting and redepositing existing soils

Thickness of soil material to be salvaged and stockpiled:	12 to 24 inches
Area from which soil material can be salvaged: (show on map)	112.3 acres
Volume of soil to be stockpiled:	271,790 cu. yds.
(cross reference with item 106.5 (a))	

Describe how topsoil or subsoil material will be removed, stockpiled and protected.
See attached addendum and Exhibit A.

106.7 - Existing vegetative communities to establish revegetation success

Vegetation - The operator is required to return the land to a useful condition and reestablish at least 70 percent of the premining vegetation ground cover. See attached addendum and exhibit

Provide the Division with a description of the plant species growing onsite and the percent vegetation cover for each plant community located on the site. Describe the methodology used to obtain these values. See attached addendum and exhibit

The percent ground cover is determined by sampling the vegetation type(s) on the areas to be mined (see Attachment I for suggested sampling methods). See attached addendum and exhibit

DRAFT

(a) Vegetation Survey - The following information needs to be completed based upon the vegetation survey:

	Transect
Sampling method used	
Number of plots or transects	6

Ground Cover	Percent
Vegetation (perennial grass, forb and shrub cover)	58
Litter	21
Rock/rock fragments	11
Bare ground	10
	100%
Revegetation Requirement (70 percent of above vegetation figure)	41 %

Indicate the vegetation community(ies) found at the site.

List the predominant perennial species of vegetation growing in each vegetation community type.

Big sagebrush (Artemisia tridentata)

Prickly-pear cactus (Opuntia)

Broom snakeweed (Gutierrezia sarothrae)

Gumweed (Grindelia squar rosa)

Salina wild rye (Elymus salinus)

Crested wheatgrass (Agropyron cristatum)

Goldenweed (Haplopappys)

Cheatgrass (Bromus tectorum)

(b) Photographs - The operator may submit photographs (prints) of the site to show existing vegetation conditions. These photographs should show the general appearance and condition of the area to be affected and may be utilized for comparison upon reclamation of the site. Photographs should be clearly marked as to the location, orientation and the date they were taken.

See Exhibit A.

106.8 - Depth to groundwater, overburden material & geologic setting

Describe the approximate depth to groundwater in the vicinity of the operation based on the completion of any monitoring or water wells in the area. Please show the location of these wells on the base map.

Depth to groundwater 370 ft. from lowest elevation

Provide a narrative description of the geology of the area and/or a geologic cross section.

See attached addendum

106.9 - Location and size of ore and waste stockpiles, tailings and treatment ponds, and discharges

Describe the location and size of any proposed waste/overburden dumps, stockpiles, tailings facilities and water storage or treatment ponds. See attached addendum

DRAFT

Describe how overburden material will be removed and stockpiled.
No overburden is anticipated. See attached addendum.
Describe how tailings, waste rock, rejected materials, etc. will be disposed of.
None is anticipated. See attached addendum.

Describe the acreage and capacity of waste dumps, tailings ponds and water storage ponds to be constructed. All impoundments must include the necessary hydrologic calculations to determine if they are adequately sized to handle storm events.

Describe any proposed effluent discharge points (UPDES) and show their location on the surface facilities map. Give the proposed discharge rate and expected water quality. Attach chemical analyses of such discharge if available.

IV. R647-4-107 - Operation Practices

During operations, the operator shall conform to the practices listed under this section of the Minerals Rules unless the Division grants a variance in writing.

Identify any potentially deleterious materials that may be stored on site (including fuel, oil, processing chemicals, etc.) and describe how they will be handled and stored. See attached addendum.

Please describe any contemporaneous reclamation that will be done prior to final closure. Reference these areas on a map. Not applicable.

V. Rule R647-108 - Hole Plugging Requirements

All drill holes which will not eventually be consumed by mining must be plugged according to the methods listed in this section. Describe the location of any aquifers encountered by drilling and the method to be used to plug such water containing holes. Describe the method to be used for plugging holes not containing water. See attached addendum.

VI. Rule R647-109 - Impact Statement

Please provide a general narrative description identifying potential surface and/or subsurface impacts. Where applicable, this description should include potential impacts to: surface and groundwater systems, threatened or endangered species or their critical habitats, existing soil resources for reclamation, slope stability, erosion control, air quality, and public health and safety.
See attached addendum.

109.1 - Surface and groundwater systems

Describe any impacts to surface or groundwater that could arise from this mining operation. How will these impacts be monitored and mitigated? The appropriate groundwater and surface water permits need to be obtained from the Division of Water Quality. Please reference any such permits. All applicable permits will be obtained. See attached addendum.

109.2 - Wildlife habitat and endangered species

Describe the impacts on wildlife habitat associated with this operation. Are big game species found in the area? Is the area associated with riparian habitat? If so, what will the

impacts be on riparian areas? Is waterfowl associated in some way with this site, either as a fly-over, temporary resident or permanent resident. See attached addendum.

List any threatened or endangered wildlife species found in the area. Discuss impacts to threatened or endangered species and their habitats. See attached addendum.

109.3 - Existing soil and plant resources

Explain how the operation might impact existing soil and plant resources in the area to be affected. Are there riparian or wetland areas which will be affected by mining? Will these areas be rehabilitated or will the operation result in permanent impacts? Are there any threatened or endangered plant species in the affected areas? See attached addendum.

109.4 - Slope stability, erosion control, air quality, public health & safety

Describe the possible impacts of this mining operation on slope stability, erosion, air quality, public health and safety. Include descriptions of highwalls and slope configurations and their stability. See attached addendum and exhibits.

The operator needs to establish the fact that an air quality permit has already been obtained or has been applied for. Explain the status of this permit and its requirements in relation to your operation.

109.5 - Actions proposed to mitigate any of the above impacts

The operator must address this section if impacts to any of the above categories will occur.

VII. Rule R647-4-110 - RECLAMATION PLAN

110.1 - Current land use and postmining land use

Current or premining land use(s) [other than mining]: Land is currently vacant.

List future post-mine land-use(s) proposed: Wildlife habitat, grazing.

(Develop the reclamation plan to meet proposed post-mine land use.)
See attached Exhibit A.

110.2 - Reclamation of roads, highwalls, slopes, leach pads, dumps, etc.

Describe how the following features will be reclaimed: roads, highwalls, slopes, impoundments, drainages and natural drainage patterns, pits, ponds, dumps, shafts, adits, drill holes and leach pads. Describe the configuration of these features after final reclamation. Describe the rinsing and neutralization of leach pads associated with final decommissioning.

Reclamation plans for impoundments, pits, ponds shall include:

1) The final elevations and final disposition of the drainage in and around the impoundment. If the impoundment, pit, or pond is intended to be left as part of the

post-mining land use, then an agreement with the land managing agency is required, if appropriate.

2) The final size of the impoundment, pit, pond in acre-feet of storage is required, as well as, the capacity of the spillway to safely pass storm events.

3) Impoundments, pits, and ponds, where not needed or approved as part of the post mining land use, shall be reclaimed, free draining, and the natural drainage patterns restored.

Reclamation plans for drainages shall include:

1) The reestablishment of a natural drainage pattern which fits in with the upstream and downstream cross-section of existing drainage in the vicinity of the disturbance.

2) The reestablishment of a stable channel in the reclaimed reach of channel, using the necessary armouring to prevent excessive erosion and downstream sedimentation.

3) Cross-sections and profiles of reestablished channels will be required when drainages are being reclaimed to demonstrate compatibility with existing drainage characteristics.

Reclamation plans for drill holes and leach pads shall include:

1) A demonstration that the requirements of R647-109.1 will be met. This shall include but not be limited to: detailed plans to decommission all heap leach pads and plans to adequately plug all drill holes.

2) Any heap leach operations will provide the necessary surface water and ground water quality data to demonstrate that impacts to these resources will not occur following mining and reclamation.

NOTE: The Minerals Rules require overall highwall of no more than 45° at final reclamation unless a variance is granted. All dump or fill slopes should be left at an angle of 3h:1v or less. Any slopes steeper than 3h:1v must be reclaimed using state-of-the-art surface stabilization technology. Pit benches exceeding 35 feet in width should be topsoiled, or covered with fines, and revegetated.

Backfilling and Grading

Describe equipment and methods to be used in any backfilling or regrading operations. Describe the amount of materials to be moved and final disposition of any stockpiled materials.

110.3 - Surface facilities to be left

Describe any surface facilities which are proposed to remain on-site after reclamation (buildings, utilities, roads, drainage structures, impoundments, etc.). Describe their post-mine application. *Justification for not reclaiming these facilities must be included in the variance request section.*

110.4 - Treatment, location and disposition of deleterious materials

Describe the nature and extent of any hazardous materials located on-site.

Describe how hazardous materials will be neutralized, removed from the site, or buried on site.

Disposal of Trash
Describe how buildings, foundations, trash and other waste materials will be disposed of.

110.5 - Revegetation planting program and topsoil redistribution

Describe the revegetation tasks to be performed in detail. For example, will ripping, mulching, fertilizing, seeding and scarifying of these areas be performed and if so, how will this be accomplished? Will topsoil be used? If so, to what depth, and what type of amendments might be applied to the topsoil? Correlate this information with the Reclamation Treatments Map.

Provide a seed mix listing adaptable plant species that will be used at the site for reclamation. More than one seed mix may be needed, depending upon the areas to be reclaimed. Keep the proposed post-mining land use in mind when developing seed mixes.

a) Soil Material Replacement
In order to reestablish the required ground cover, one to two feet (depending on underlying material) of suitable soil material usually has to be redistributed on the areas to be reseeded. If the stockpiled soil isn't sufficient for this, soil borrow areas will need to be located.

How much soil material will be placed on the area to be reseeded? Where will this material come from? How will the material be transported and spread?

b) Seed Bed Preparation

Describe how the seedbed will be prepared and equipment to be used.
The Division recommends ripping or discing to a minimum of 12 inches and leaving the seed bed surface in as roughened condition as possible to enhance water harvesting, erosion control and revegetation success. Compacted surfaces such as roads and pads should be deep ripped a minimum of 18 inches.

c) Seed Mixture - List the species to be seeded: See Exhibit B.

Example

Species Name	Common Name	Seeding Rate (lbs Pure Live Seed/Acre)
	Total lbs/acre	14

(The Division recommends seeding 12-15 lbs./acre of native and introduced adaptable species of grass, forb, and browse seed for drill seeding and 15-20 lbs./acre for broadcast or hydro seeding. The Division can provide assistance in developing reclamation seed mixes if requested).

d) Seeding Method
Describe method of planting the seed.
The Division recommends planting the seed with a rangeland or farm drill. If broadcast seeding, harrow or rake the seed 1/4 to ½ inch into the soil. Fall is the preferred time to seed.

e) Fertilization
Describe fertilization method, type(s) and application rate.

f) Other Revegetation Procedures
Please describe other reclamation procedures, such as mulching, irrigation, hydroseeding, etc., that may be planned.

VIII. Rule R647-4-112 VARIANCE

The operator may request a variance from Rules R647-4-107 (Operation Practices), R647-4-108 (Hole Plugging), and R647-4-111 (Reclamation Practices) by submitting the following information:

1.11 the rule(s) which a variance is requested from: (rule number and content)

1.12 a description of the specific variance requested and a description of the area affected by the variance request; show this area on the Reclamation Treatments Map(s).

1.13 justification for the variance;

1.14 alternate methods or measures to be utilized in the variance area.

Variance requests are considered on a site-specific basis. For each variance requested, attach a narrative which addresses the four items listed above.

IX. Rule R647-4-113 - SURETY

A Reclamation surety must be provided to the Division prior to final approval of this application. In calculating this amount, include the following major tasks:

1) Clean-up and removal of structures.
2) Backfilling, grading and contouring.
3) Soil material redistribution and stabilization.
4) Revegetation (preparation, seeding, mulching).
5) Safety gates, berms, barriers, signs, etc.
6) Demolition, removal or burial of facilities/structures, regrading/ripping of facilities areas.
7) Regrading, ripping of waste dump tops and slopes.
8) Regrading/ripping stockpiles, pads and other compacted areas.
9) Ripping pit floors and access roads.
10) Drainage reconstruction.
11) Mulching, fertilizing and seeding the affected areas.
12) General site clean up and removal of trash and debris.

13) Removal/disposal of hazardous materials.
14) Equipment mobilization.
15) Supervision during reclamation.

To assist the Division in determining a reasonable surety amount, please attach a reclamation cost estimate which addresses each of the above steps. The areas and treatments included in the reclamation treatments map should correspond with items included in the reclamation cost estimate. The reclamation costs used by the Division must be third party costs.

X. SIGNATURE REQUIREMENT

I hereby certify that the foregoing is true and correct.

Signature of Operator/Applicant: _____

Name (typed or print): Brent R. Sumsion

Title/Position (if applicable): President

Date: Oct. 27, 1997

PLEASE NOTE:

Section 40-8-13(2) of the Mined Land Reclamation Act provides for maintenance of confidentiality concerning certain portions of this report. Please check to see that any information desired to be held confidential is so labeled and included on separate sheets or maps.
Only information relating to the location, size or nature of the deposit may be protected as confidential.

Confidential Information Enclosed: ( ) Yes ( ) No

Attachment I

Vegetation Cover Sampling

Vegetation cover sampling determines the amount of ground that is covered by live vegetation. It is divided into four categories which equal 100 percent. They are:

Vegetation - This is the live perennial vegetation. Care should be taken to avoid sampling in disturbed areas that have a large percentage of annual or weedy vegetation, such as cheatgrass and russian thistle.

Litter - This is the dead vegetation on the ground, such as leaf and stem litter.

Rock/rock fragments - This is the rock and rock fragments on the soil surface.

Bare ground - This is the bare soil which is exposed to wind and water erosion.

Cover Sampling - The following methods are acceptable:

Ocular Estimation

This method visually estimates the percentage of ground covered in a plot by the four components. Plot size is usually a meter or yard square or a circular plot 36 inches in diameter. Ten to twenty plots should be randomly sampled in each major vegetation type.

Line Intercept

Percent ground cover is obtained by stretching a tape measure (usually 100') over the ground and then recording which of the four components is under each foot mark. At least ten of these transects should be randomly laid out and measured in each major vegetation type.

Soil Survey and Sampling Methods

If a SCS or land management agency soil survey is not available, the operator shall delineate all soil types that will be disturbed by mining on a map. Each soil type shall be sampled for its characteristics and inherent properties. Representative sampling locations should have similar geologic parent material, slopes, vegetative communities and aspects. The sampling locations should be representative of the soil type and be identified on the map. Sampling shall be at a minimum of one for each soil type disturbed.

The soil map needs to be of sufficient scale so that each soil type can be accurately located on the ground.

Addendum to Form MR-LMO
Notice of Intention to Commence Large Mining Operations

III. Rule R647-4-106 – Operation Plan (page 5)

106.2 – *Type of operation conducted:*

Blast holes will be drilled with an air track drill which will be equipped with a vacuum dust collection system to minimize dust. Explosives will be loaded and the holes shot approximately once per week. MSHA regulations will be followed. Broken rock will be trammed to the crusher by means of a rubber-tired loader. The crushed product will be transported by conveyor to the stockpile area. Due to the quarrying method, reclamation will not be feasible until the end of the operation. (See variance request.)

106.4 – *Nature of material including waste rock/overburden and estimated tonnage:*

An annual production of 600,000 cubic yards of limestone is anticipated. The entire property is underlain by the Great Blue Limestone Formation of Mississippian age. The strike and dip vary slightly, but overall the units strike east and west and dip north to northeast at about 30 degrees. The drill holes indicate that the hill is composed of solid massive hard limestone. The limestone is so near the surface—within a foot—that little waste material or overburden is anticipated.

106.6 – *Plan for protecting and redepositing existing soils:*

The soil and growth materials will be stripped using a dozer, placed in dump trucks with a loader, and used to create the berm depicted on the plans and stored in the area so labeled on the drawings. The materials will be removed from the berm and redistributed over the disturbed areas for reclamation purposes upon conclusion of the mining operation. (See Exhibits A and B.)

106.7 – *Existing vegetative communities to establish revegetation success:*

Existing vegetation percent cover was determined in order to provide a baseline for the revegetation goal of 70 percent of current cover. Existing vegetation and ground conditions found at the site and the reclamation plan are described in the attached Exhibit A.

106.8 – *Depth to groundwater, overbuden material, and geologic setting:*

With regard to the geologic setting, the Lehi limestone property occupies a quarter section located on Highway 73 west of Lehi at the northern end of Utah Lake in Utah County, Utah. The site is undeveloped and consists of a hill that

rises approximately 370 feet above the highway. Topographically, the hill has two knobs that occupy the northern half of the property and a lower knob on the side located in the middle of the property. The surface of the property was geologically mapped by standard methods the summer of 1997. Two vertical core drill holes verified the geology indicated by the surface mapping. One hole was placed in a top knob and extended to 400 feet, slightly below road level. The other was on the side knob in the middle of the property. It was drilled 200 feet deep, also slightly below road elevation. Both indicated that the hills could be mined to road level entirely in limestone. The actual thickness of the limestone will exceed 400 feet. Groundwater elevation is at 4520 feet.

106.9 – *Location and size of ore and waste stockpiles, tailings, and treatment ponds, and discharges:*

No overburden material, waste, or tailings are anticipated.

IV. R647-4-107 – Operation Practices (page 8)

With regard to potentially deleterious materials, only used lubricants are expected to be generated on site. These materials will be disposed at a proper facility or recycled as appropriate. No analyses are required to be conducted on these materials. No contemporaneous reclamation will be done prior to final closure.

V. R647-108 – Hole Plugging (page 8)

Only two exploratory drills were performed, both of which are in the mining area. For mining purposes, all drill holes will be loaded and shot. No drill holes will remain which will require plugging.

VI. Rule R674-109 – Impact Statement (page 8)

A small mine permit has previously been issued for this site. There are no endangered species or critical habitats or any wetlands existing in this area or surrounding vicinity. No adverse impacts to surface or groundwater systems are expected. Surface water from the operation will be directed to settling ponds. Existing soil resources are to be stockpiled in the berm for reclamation and then removed from the berm and redistributed over the disturbed areas and revegetated as described in the Reclamation Plan attached as Exhibit A. Erosion control will comply with water quality standards. The facility will be operated in compliance with air quality standards, and air permits will be obtained.

109.1 – *Surface and groundwater systems:*

All appropriate water permits will be obtained. No impacts to groundwater or surface water are anticipated.

109.2 – *Wildlife habitat and endangered species:*

The proposed operation will have no adverse impact on existing wildlife habitat; there is no endangered species or big game species existing on or near the subject property. The area is not associated with riparian habitat. No waterfowl are associated with this site, whether as a fly-over, temporary residence, or permanent residence.

109.3 – *Existing soil and plant resources:*

Existing vegetation and tree growth are described in Exhibit A.

109.4 – *Slope stability, erosion control, air quality, public health and safety:*

An application for an air quality permit is currently being prepared for submission to the State Division of Air Pollution Control. The facility will be operated in compliance with the Division's criteria. Slope stability is addressed in the high wall variance request included as Exhibit C.

109.5 – *Actions proposed to mitigate any of the above impacts:*

No impacts are anticipated which would require mitigation.

VII. R647-4-110 – Reclamation Plan (page 9)

See the Reclamation Plan attached as Exhibit A.

110.2 – *Reclamation of roads, highwalls, slopes, leach pads, dumps, etc.:*

The reclamation area map, included in Exhibit A, depicts the areas to be reclaimed and the finished contours. The haul roads will be scarified, and all areas to be reclaimed will receive the growth medium soil reserved on site.

There will be no leach pads. Both of the two drill holes are within the mining area.

A vertical highwall variance is requested. (See Exhibit C.)

110.3 – *Surface facilities to be left:*

No stockpiled materials will remain on site. Any stockpiled material existing at the time the mining operation ceases will be sold and/or used commercially.

No buildings, utilities, etc., will remain on site.

110.4 – *Treatment, location and disposition of deleterious materials.*

No hazardous materials will be located on site. All trash will be disposed of at acceptable, licensed landfills.

110.5 – *Revegetation planting program and topsoil redistribution:*

The topsoil stored in the berm area will be moved by scrapers to the areas being reclaimed and will be spread to a thickness of approximately 18 inches. See Exhibit A for seed mixture and application rates.

IX. Rule R647-4-113 – Surety (page 12)

The first five years of operation will result in a disturbed area of 30 acres. Approximately 72,600 cubic yards of growth medium will be retained on site for use in reclamation. The amount of reclamation surety was calculated based on the following estimated costs:

Clean up and removal of structures	$ 2,000
Earth work (moving 2,000 cubic yards/day) --	
Cat 623E Scraper (23-cubic-yard capacity), 326 hours @ $10/hour	32,600
Cat D-8N Dozer, 163 hours @ $115/hour	18,745
Cat 140H Grader, 163 hours @ $80/hour	13,040
Seed drill, 27 hours @ $40/hour	1,080
Seed cost (14.11 lbs/acre), 425 lbs @ $25/lb	10,625
Other plantings (lump sum)	2,500
Equipment mobilization	2,500
Supervision	4,500
Miscellaneous (disposal fee, safety signs, general clearing)	5,000
Total	$92,590

Exhibit A

RECLAMATION PLAN AND PHOTOGRAPHS

RECLAMATION PLAN
FOR
LEHI QUARRY

Because of the nature of the activity and the method to be employed at this site--a vertical high-wall quarry--reclamation will be performed upon completion of the mining operation, a period of **twenty-five** years. Upon concluding the mining activity, the growth medium will be removed from the berm and/or stockpiles using bulldozers and scrapers and will be spread over the disturbed ground of the plant and yard area, the floor of the pit areas, the stockpiling areas and the road.

In preparation for site reclamation, observations were obtained on vegetation cover at the subject site (located approximately three miles west of Lehi, Utah, on State Highway 73) on September 19, 1997. Existing vegetation percent cover was determined in order to provide a baseline for the revegetation goal of 70 percent of current cover at sites which will undergo mining activities. Vegetation cover is necessary to control erosion and dust problems in the pit area; however, site limitations for revegetation can include steep slopes, low levels of soil nutrients, west- or south-facing aspect, and low annual precipitation. Drought-hardy native vegetation is most appropriate for site reclamation because such plants will provide long-term cover for effective erosion control, wildlife habitat, and pleasing visual continuity with the adjacent areas.

Methods: Vegetation was surveyed on a level area, a steep south-facing slope, and a steep north-facing slope. The line intercept method with six 100-foot transects with data points at one-foot intervals was used to obtain foliar cover estimates and composition. Data points were designated as either vegetation (perennial grass, forb, shrub, and tree cover), plant litter, bare ground, or rock/rock fragments. Dominant plant species were noted.

Site soil samples are currently undergoing analysis for nutrient levels and other chemical or physical factors which may limit revegetation success. Tests include nitrogen, phosphorus, and potassium levels; sodium absorption ratio; cation exchange capacity; electrical conductivity; percent organic matter; and pH.

Results: The site occurs on level areas and low elevation hills vegetated with a sagebrush/grass-forb community. Parts of the level areas appear to have been revegetated in the past with crested wheatgrass. The steep south-facing slope has areas disturbed by off-road vehicles; the steep north-facing slope is undisturbed except for several dirt roads. Elevations range from approximately 4850 to 5200 feet. In this area, annual rainfall is 14 to 18 inches, mean annual temperature is 49 to 52 degrees Fahrenheit, and the frost-free period is 150 to 170 days (Soil Conservation Service, 1972).

Average vegetation cover, including mosses, on the transects was 58 percent (range from 50 to 65 percent), litter cover 21 percent, bare ground 10 percent, and rock or rock fragments 11 percent (*Table 1*).

Table 1. Percent Vegetation, Litter, Bare Ground, and Rock/Rock Fragments

Transect	Percent Vegetation	Percent Litter	Percent Bare Ground	Percent Rock/ Rock Fragments
1	55	18	15	12
2	56	34	4	6
3	65	16	5	14
4	50	12	14	24
5	65	20	10	5
6	56	28	10	6
Average	58	21	10	11

The four dominant perennial vegetation species were: Big sagebrush (*Artemisia tridentata*), Broom snakeweed (*Gutierrezia sarothrae*), Salina wildrye (*Elymus salinus*), and Goldenweed (*Haplopappus* sp.). Other vegetation species present on the site at the time of the survey included (by common name) rubber rabbitbrush, prickly-pear cactus, claretcup cactus, gumweed, common sunflower, ragweed, sand dropseed, crested wheatgrass, and mosses. Non-native weed species included Russian thistle, tumble mustard, alyssum, storkbill, wild lettuce, and cheatgrass. Nomenclature follows Welsh *et al.* (1993).

Conclusion: The revegetation goal of 70 percent of current average vegetation cover that is designated by UDOGM will be 41 percent vegetation cover (State of Utah, 1996). Recommendations for reclamation to control erosion and attain the revegetation goal include:

- Conducting reclamation after mining activities have been concluded.
- Stockpiling topsoil to spread as revegetation growth medium over the entire disturbed area.
- Planting and seeding at rates sufficient to achieve 41 percent vegetation cover, or greater.
- Using drought-tolerant native species (*Tables 3 and 4)*, including bluebunch wheatgrass (*Pseudorogneria spicata/Elymus spicatus*), sand dropseed (*Sporobolus cryptandrus*), Indian ricegrass (*Oryzopsis humenoides*), purple three-awn (*Aristida purpurea*), bluegrass (*Poa sandbergii*), common paintbrush (*Castilleja chromosa*), blue flax (*Linum lewisii*), goldenweed (*Haplopappus tenuisectus*), and rubber rabbitbrush (*Chrysothamnus nauseosus*).

Measures to enhance revegetation success include:

- Use of laboratory soil analyses to guide soil amendments and fertilizers.
- Application of soil amendments including fertilizer, organic matter, and binding agents.
- Ripping of residual material to help hold soil additives.

- Application and anchoring of hay or straw mulch.
- Creating variation in slope steepness and topography through site grading.
- Diversion of natural slope drainage to revegetated areas on the slopes where additional moisture is needed to facilitate vegetation diversity (e.g., creating pockets of shrubs).

References:

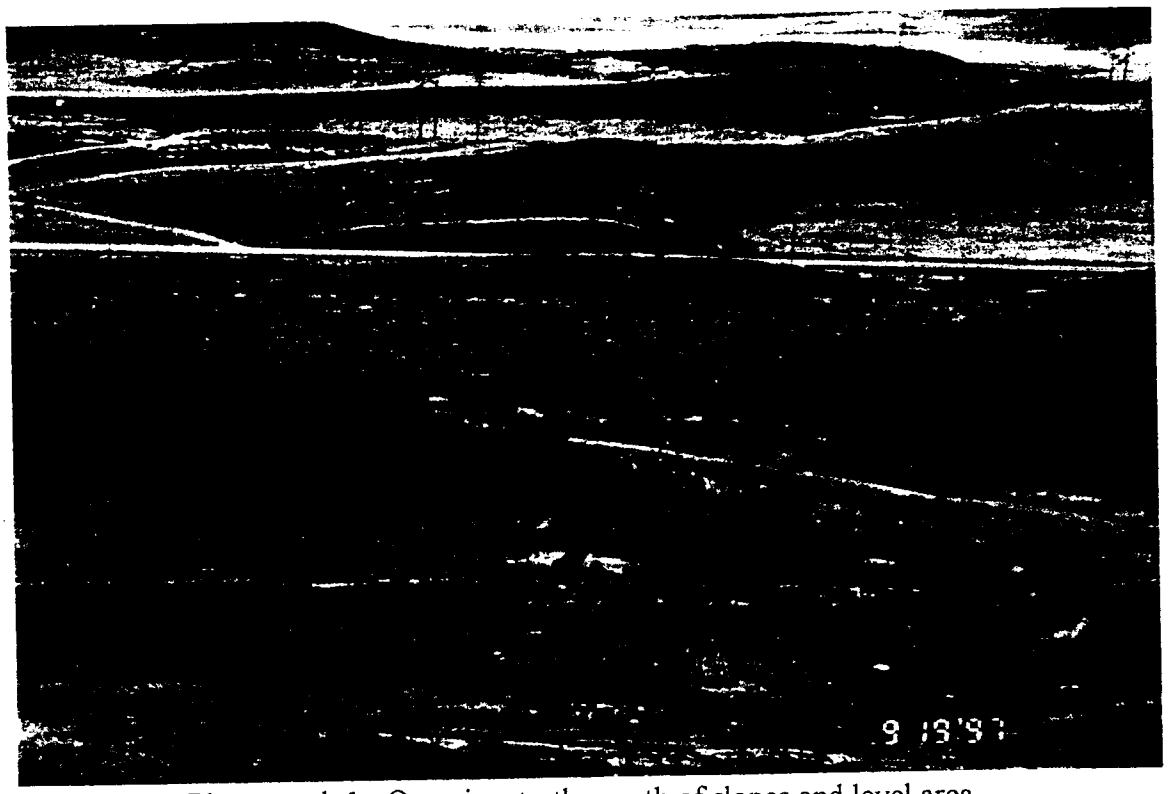
- Soil Conservation Service, 1972. Soil Survey of Utah County, Utah.
- State of Utah, Department of Natural Resources, Division of Oil, Gas, and Mining. 1996. Form MR-LMO.
- Welsh *et al.* 1993. A Utah Flora. Brigham Young University, Provo, Utah.

Table 3. Recommended Native Grass Species for Revegetation

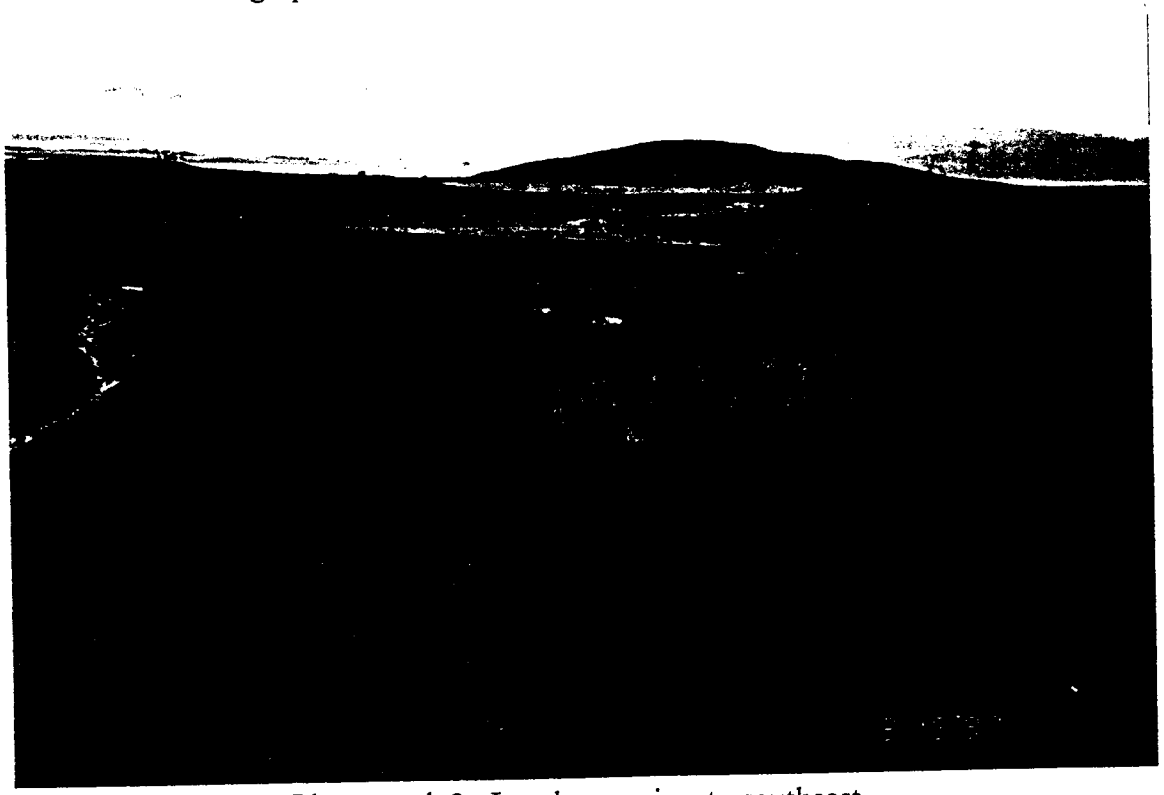
Grasses								
Common Name	Scientific Name	Height	Season	Type	Min. precip.	Soil Texture	Soil pH	Planting Time
Bluebunch wheatgrass	*Pseudorogneria spicata (Elymus spicatus)*	Medium	Cool	Sodformer	8"	OK in medium coarse	Best in neutral	Fall or spring
Indian ricegrass	*Oryzopsis hymenoides*	Medium	Cool	Bunchgrass	9"	Coarse, medium coarse	Best in neutral	Fall
Sand dropseed	*Sporobolus cryptandrus*	Medium	Warm	Bunchgrass	10"	Coarse, medium coarse	Ok in alkaline Best in neutral	Late summer
Purple three-awn	*Aristida purpurea*	Short to medium	Cool	Bunchgrass	10"	Best in medium coarse	Best in neutral	Fall or spring to summer
Sandburg bluegrass	*Poa sandbergii*	Medium	Cool	Bunchgrass	8"	Best in medium coarse	OK in alkaline	Fall or spring

Table 4. Recommended Native Forbs and Shrubs for Revegetation

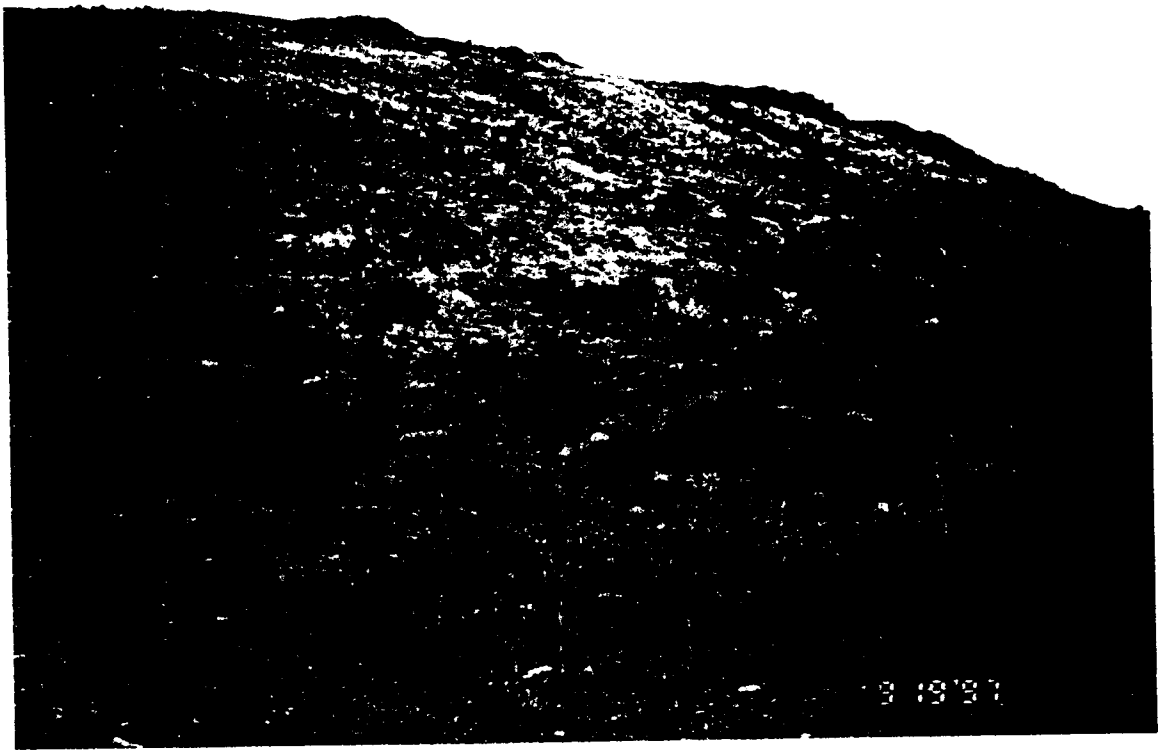
Forbs							
Common Name	Scientific Name	Height	Blooming Season	Color of Bloom	Min. precip.	Soil Texture	Soil pH
Common paintbrush	*Castilleja chromosa*	4-18"	Spring, summer	Red	Low	Medium fine to medium coarse	Best in neutral
Blue flax	*Linum lewisii*	24"	Summer	Blue	Low	Medium coarse	Best in neutral
Shrubs							
Goldenweed	*Haplopappus tenuisectus*	1-3"	Fall	Yellow	6"	Medium to medium coarse	Neutral OK in alkaline
Rubber rabbitbrush	*Chrysothamnus nauseosus*	2-7'	Fall	Yellow	8"	Medium coarse	OK in alkaline



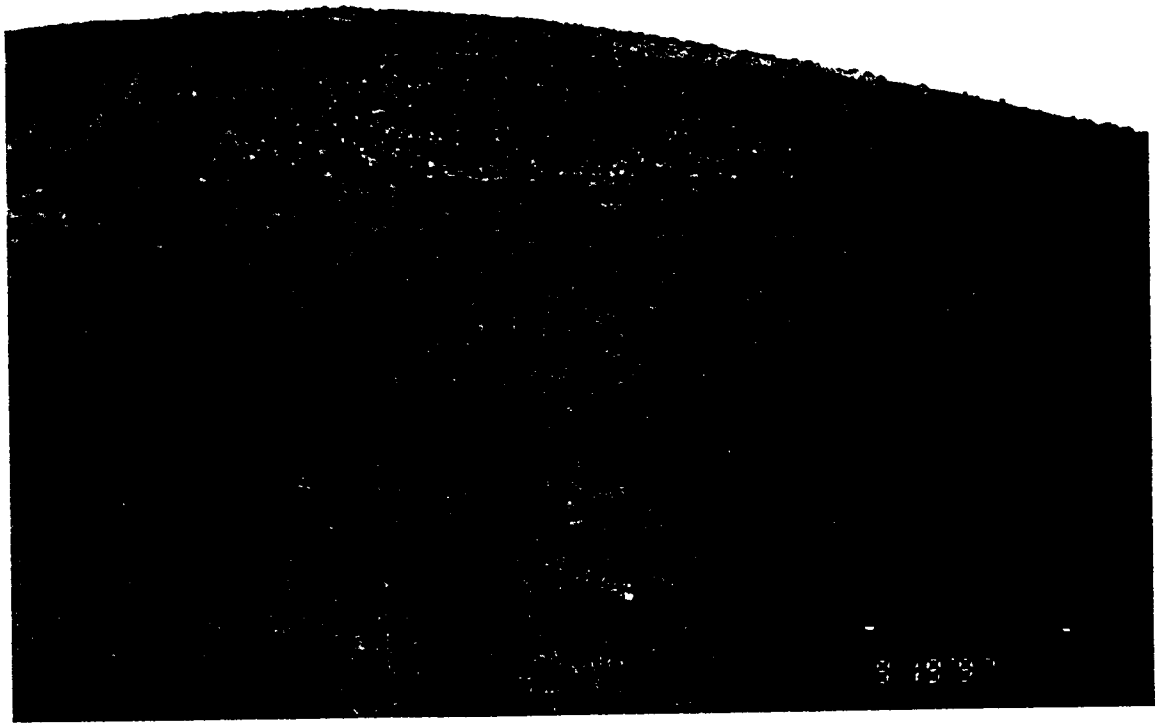
Photograph 1. Overview to the south of slopes and level area.



Photograph 2. Level area, view to southeast.



Photograph 3. Steep south-facing slope.



Photograph 4. North-facing slopes, view to west.

Exhibit B

SOILS INFORMATION

WISER COMPANY, LLC

1431 KENSINGTON SQUARE COURT
MURFREESBORO, TENNESSEE 37130
(615) 896-7375 • FAX (615) 890-7016

November 14, 1997

Mr. Lynn Kunzler
Utah Department of Natural Resources
Division of Oil, Gas, and Mining
P. O. Box 145801
Salt Lake City, UT 84114-5801

RE: Lehi Quarry

Dear Lynn:

The following is the soils analysis information provided by Colorado Analytical Laboratory for the Lehi Quarry site:

Site	North-Facing Slope	South-Facing Slope	Level Area
pH (units)	7.8	7.8	7.9
Electroconductivity (mmhos/cm)	0.44	0.40	0.34
Organic matter (%)	2.15	3.00	1.64
Nitrates NO3-N (ppm)	3.7	11.9	5.7
Available phosphorus (ppm)	20.5	11.5	13.5
Available potassium (ppm)	781	629	519
Cation exchange capacity (meq/100g)	14.4	11.2	8.4
Sodium absorption ratio (units)	0.5	0.5	0.7
Sulfate (ppm as SO4)	16.2	17.9	15.9

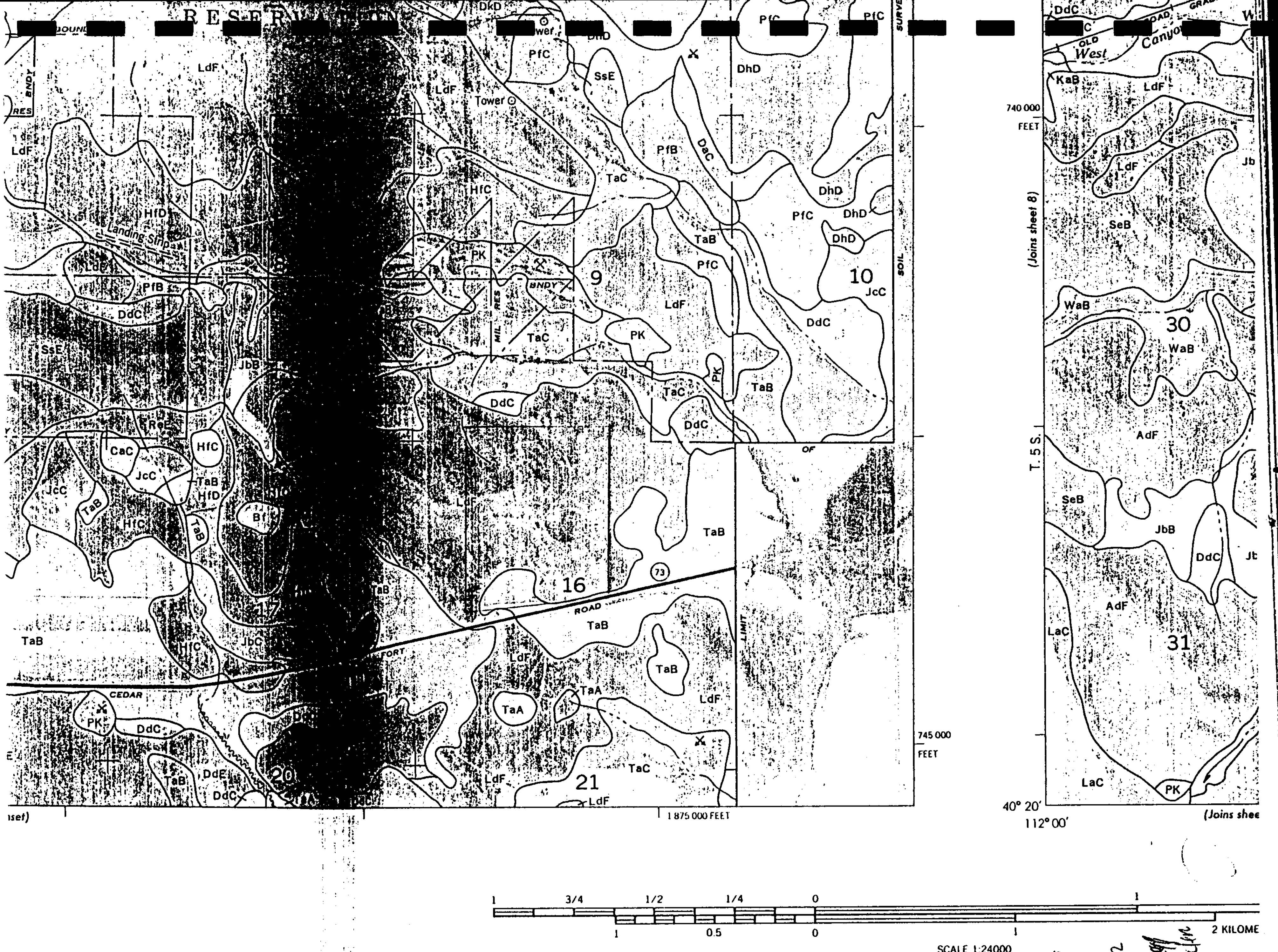
Let me know if you need any other information.

Sincerely,

WISER COMPANY, LLC

Rick S. Cantrell
Manager

RSC/ld


RESERVATION
BOUNDARY
BNDY
RES
Tower
Landing Strip
MIL RES
SOIL SURVEY
LIMIT OF
CEDAR FORT ROAD
73
8
9
10
16
17
20
21
30
31
OLD West Canyon ROAD
740 000 FEET
745 000 FEET
1 875 000 FEET
(Joins sheet 8)
T. 5 S.
40° 20′
112° 00′
(Joins sheet
inset)
LdF
PfC
DhD
SsE
DaC
PfB
TaC
HfC
HfD
DdC
PK
TaB
JcC
TaA
JbB
CaC
ReE
JbC
Bf
DdE
KaB
SeB
WaB
AdF
DdC
LaC
1
3/4
1/2
1/4
0
1
0.5
0
1
2 KILOMETERS
SCALE 1:24000
571
1292

FIELD OFFICE TECHNICAL GUIDE: SECTION II-E
LOCATION: MLRA 028A
AREA:
STATE: UTAH

RANGE SITE DESCRIPTION

RANGE SITE NAME: UPLAND SHALLOW LOAM (UTAH JUNIPER- SINGLEAF PINYON)

RANGE SITE NUMBER: 028AY324UT

ORIGINAL DATE: 03/01/1988

REVISION DATE: 06/29/1993

AUTHOR'S INITIALS: DJS

I. SOIL NARRATIVE:

THIS SITE OCCURS ON FOOTHILLS, ROLLING HILLS, STONY RIDGES, CANYON SIDES, FAIRLY STEEP MOUNTAIN SLOPES, AND HIGHLY DISSECTED PEDIMENTS. THE CHARACTERISTIC SOILS IN THIS SITE ARE 10 TO 20 INCHES DEEP OVER BEDROCK AND SOMEWHAT EXCESSIVELY DRAINED. THEY FORMED IN COLLUVIUM AND RESIDUUM DERIVED MAINLY FROM LIMESTONE AND CHERT PARENT MATERIALS. THE SURFACE IS VERY GRAVELLY LOAM TEXTURES AND 5 INCHES THICK. ABOUT 50 PERCENT OF THE SOIL SURFACE IS COVERED BY ROCK FRAGMENTS. THE VOLUME OF ROCK FRAGMENTS IN THE SOIL PROFILE IS 35 TO 60 PERCENT. SOILS ARE MODERATELY TO RAPIDLY PERMEABLE. THEY ARE GENERALLY VERY STRONGLY CALCAREOUS WITH MORE THAN 40 PERCENT CARBONATES. RUNOFF IS RAPID OR VERY RAPID AND HAZARD OF WATER EROSION IS SERVERE OR VERY SERVERE. AVAILABLE WATER CAPACITY IS 1 TO 5 INCHES. NATURAL GEOLOGIC EROSION IN POTENTIAL IS APPROXIMATELY 0.2 TONS/ACRE/YEAR.

THE CLIMATE IS CHARACTERIZED BY COLD, SNOWY WINTERS AND WARM DRY SUMMERS. THE AVERAGE ANNUAL PRECIPITATION IS MOSTLY 12 TO 18 INCHES, BUT IN A FEW INSTANCES IS AS HIGH AS 20 INCHES ON SOUTH AND WEST EXPOSURES. JUNE IS COMMONLY THE DRIEST MONTH IN PRECIPITATION. ANNUAL DISTRIBUTION VARIES FROM 20 TO 45 PERCENT DURING THE PLANT GROWTH PERIOD, MAY TO OCTOBER. HOWEVER, THIS IS USUALLY NOT TOO EFFECTIVE IN INFLUENCING PLANT GROWTH SINCE IT COMES AS SMALL AS INTENSE CLOUD BURSTS WHERE CONSIDERABLE RUNOFF OCCURS, ESPECIALLY IN JULY AND AUGUST. THE EFFECTIVE MOISTURE FOR PLANT GROWTH IS THE 55 TO 80 PERCENT THAT FALLS DURING THE WINTER PLANT DORMANT PERIOD.

II. LIST OF SOIL TAXONOMIC UNITS OR SOILS MAPPING UNITS FOR ALL SOILS INCLUDED IN THIS SITE:

AMTOFT ST-L, MOIST	LODAR GRV-L
LUNDY GRV-L	REYWAT CBV-L
PIOCHE	BODACIOUS
ITCZ	CEDERAN

RANGE SITE NAME: UPLAND SHALLOW LOAM (UTAH JUNIPER- SINGLEAF PINYON)
RANGE SITE NUMBER: 028AY324UT

III. LANDSCAPE FACTORS

A. PHYSIOGRAPHY:

1. ELEVATION/ASPECT:

LOW 4800 ft / NOR HIGH 8000 ft / SOU

2. PERCENT SLOPE:

LOW 10
HIGH 40

IV. CLIMATE FACTORS

A. FREEZE-FREE PERIOD (FFP): 80 TO 150 (DAYS)

B. FROST-FREE PERIOD: 0 TO 0 (DAYS)

C. MEAN ANNUAL PRECIPITATION (MAP): 12 TO 16 (INCHES)

D. MEAN ANNUAL AIR TEMPERATURE (MAAT): 45 TO 49 (F)

E. MEAN ANNUAL SOIL TEMPERATURE (MAST): 47 TO 51 (F)

F. MOISTURE AND TEMPERATURE DISTRIBUTION:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
- PPT -												
HIGH	1.70	1.90	2.30	2.30	2.30	1.60	1.30	1.60	2.00	2.10	1.90	1.90
MEAN	1.20	1.30	1.60	1.60	1.50	0.90	0.80	1.00	1.20	1.40	1.30	1.20
LOW	0.60	0.60	0.70	0.70	0.60	0.30	0.30	0.30	0.30	0.60	0.60	0.50
- TEMP -												
HIGH	37	43	52	61	72	82	91	89	79	66	50	40
MEAN	27	32	40	48	58	67	75	73	64	52	39	29
LOW	16	21	28	35	43	52	59	58	45	37	27	19

V. VEGETATION FACTORS - CLIMAX PLANT COMMUNITY

A. RANGE SITE DESCRIPTION NARRATIVE:

THE DOMINANT ASPECT OF THE PLANT COMMUNITY IS AND OPEN STAND OF UTAH JUNIPER WITH SMALL AMOUNTS OF PINYON PINE. THE COMPOSITION BY AIR-DRY WEIGHT IS APPROXIMATELY 50-60 PERCENT PERENNIAL GRASS, 3-5 PERCENT FORBS, 40-50 PERCENT SHRUBS, AND 10-15 PERCENT TREES.

RANGE SITE NAME: UPLAND SHALLOW LOAM (UTAH JUNIPER- SINGLEAF PINYON)
RANGE SITE NUMBER: 028AY324UT

B. PERCENT COVER:

1. GROUND COVER AND STRUCTURE:

	% CANOPY COVER (VERTICAL VIEW)	AVERAGE HEIGHT (FT)	% BASAL AREA COVER
GRASSES AND GRASSLIKES	30	2.00	10
FORBS	5	2.00	3
CRYPTOGAMS	0	0.00	0
SHRUBS	40	2.00	15
TREES	20	10.00	10

C. Plant community composition and production:

1. Herbaceous

a. Grasses and grasslikes

National Symbol	Common Name	Grp	% Composition by weight	Group % Allowable
PSSP6	BLUEBUNCH WHEATGRASS	0	15 to 20	0 to 0
PONE3	NEVADA BLUEGRASS	0	10 to 15	0 to 0
ORHY	INDIAN RICEGRASS	0	5 to 10	0 to 0
ELEL5	BOTTLEBRUSH SQUIRRELTAIL	0	3 to 5	0 to 0
PASM	WESTERN WHEATGRASS	1	1 to 3	5 to 10
STCO4	NEEDLEANDTHREAD	1	1 to 3	5 to 10
KOMA	PRAIRIE JUNEGRASS	1	1 to 3	5 to 10
LESAS	SALINA WILDRYE	1	1 to 3	5 to 10
BOGR2	BLUE GRAMA	1	1 to 3	5 to 10
HIJA	GALLETA	1	1 to 3	5 to 10
SPCR	SAND DROPSEED	1	1 to 3	5 to 10
CAGE2	GEYER SEDGE	1	1 to 3	5 to 10
PPGG	OTHER PERENNIAL GRASSES	1	5 to 10	5 to 10
AAGG	OTHER ANNUAL GRASSES	1	5 to 10	5 to 10

RANGE SITE NAME: UPLAND SHALLOW LOAM (UTAH JUNIPER- SINGLEAF PINYON)
RANGE SITE NUMBER: 028AY324UT

b. Forbs

National Symbol	Common Name	Grp	% Composition by weight	Group % Allowable
PEHU	LOW BEARDTONGUE	2	1 to 3	5 to 10
ASCH2	PACIFIC ASTER	2	1 to 3	5 to 10
PEPU7	GRASSY ROCKGOLDENROD	2	1 to 3	5 to 10
PHLO2	LONGLEAF PHLOX	2	1 to 3	5 to 10
IPCOC3	BALLHEAD SKYROCKET	2	1 to 3	5 to 10
EROV	CUSHION WILD BUCKWHEAT	2	1 to 3	5 to 10
CRAC2	LONGLEAF HAWKSBEARD	2	1 to 3	5 to 10
SPGR2	GOOSEBERRYLEAF GLOBEMALLOW	2	1 to 3	5 to 10
CHDO	DUSTYMAIDEN	2	1 to 3	5 to 10
CRHU2	ROUNDSPIKE CATSEYE	2	1 to 3	5 to 10
ERPU2	SHAGGY FLEABANE	2	1 to 3	5 to 10
ANMI3	SMALL LEAF PUSSYTOES	2	1 to 3	5 to 10
ARFE3	FENDLER SANDWORT	2	1 to 3	5 to 10
CALI4	WYOMING INDIAN PAINBRUSH	2	1 to 3	5 to 10
ASLE8	FRECKELED MIKLVETCH	2	1 to 3	5 to 10
CHAL7	LAMBS QUARTER	2	1 to 3	5 to 10
DEPI	WESTERN TANSYMUSTARD	2	1 to 3	5 to 10
PPFF	OTHER PERENNIAL FORBS	2	5 to 10	5 to 10
AAFF	OTHER ANNUAL FORBS	2	5 to 10	5 to 10

2. Shrubs

National Symbol	Common Name	Grp	% Composition by weight	Group % Allowable
ARNO4	BLACK SAGEBRUSH	0	20 to 25	0 to 0
PUTR2	BITTERBRUSH	0	5 to 10	0 to 0
CEMO2	BIRCHLEAF MOUNTAINMAHOGANY	0	5 to 10	0 to 0
CHVI8	LOW RABBITBRUSH	3	1 to 3	3 to 5
PUME	MEXICAN CLIFFROSE	3	1 to 3	2 to 3
EPNE	NEVADA JOINTFIR	3	1 to 3	3 to 5
SYOR2	MOUNTAIN SNOWBERRY	3	1 to 3	3 to 5
ARTRW	WYOMING BIG SAGEBRUSH	3	1 to 3	3 to 5
AMUT	UTAH SERVICEBERRY	3	1 to 3	3 to 5
CEIN7	LITTLELEAF MOUNTAINMAHOGANY	3	1 to 3	3 to 5
OPPO	CENTRAL PRICKLYPEAR	3	1 to 3	3 to 5
CELE3	CURLLEAF MOUNTAINMAHOGANY	3	1 to 3	3 to 5
GUSA2	BROOM SNAKEWEED	3	1 to 3	3 to 5
ARTRV	MOUNTAIN BIG SAGEBRUSH	3	1 to 3	3 to 5
CEGR	MOJAVE BUCKBRUSH	3	1 to 3	3 to 5
SSSS	OTHER SHRUBS	3	3 to 5	3 to 5

3. Trees

National Symbol	Common Name	Grp	% Composition by weight	Group % Allowable
JUOS	UTAH JUNIPER	0	12 to 15	0 to
PIMO	SINGLE LEAF PINYON	0	3 to 5	0 to 0

RANGE SITE NAME: UPLAND SHALLOW LOAM (UTAH JUNIPER- SINGLEAF PINYON)
RANGE SITE NUMBER: 028AY324UT

5. Production

Grasses and grasslikes:	50 to 60	% of total
Forbs:	5 to 10	% of total
Shrubs:	40 to 50	% of total
Trees:	12 to 15	% of total
Lichen community:	0	lbs/acre (NOT ANNUAL PRODUCTION)
Moss community:	0	lbs/acre

6. Cover

Lichen community:	0 % cover
Moss community:	0 % cover

VI. PLANT GROWTH CURVES

ID	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
ER: UT3241	0	0	0	10	30	45	5	5	5	0	0	0
ME: PNC												
DESC: EXCELLENT CONDITION												

VII. TOTAL ANNUAL PRODUCTION (EXCELLENT CONDITION)

FAVORABLE	600 TO	800
AVERAGE	400 TO	600
UNFAVORABLE	100 TO	300

IX. PLANT COMMUNITY DYNAMICS:

AS ECOLOGICAL CONDITION DETERIORATES DUE TO OVERGRAZING, BLUBUNCH WHEATGRASS AND INDIAN RICEGRASS DECREASE WHILE RABBITBRUSH, SAGEBRUSH, AND ANNUAL GRASSES AND FORBS INCREASE.

WHEN THE POTENTIAL NATURAL PLANT COMMUNITY IS BURNED, JUNIPER, PINYON, BIG SAGEBRUSH, AND BITTERBRUSH DECREASE WHILE RABBITBRUSH, SANDBERG BLUGRASS, AND SERVICEBERRY INCREASE.

CHEATGRASS AND ANNUAL FORBS ARE MOST LIKELY TO INVADE THIS SITE.

RANGE SITE NAME: UPLAND SHALLOW LOAM (UTAH JUNIPER- SINGLEAF PINYON)
RANGE SITE NUMBER: 028AY324UT

X. ASSOCIATED SITES

Sites that occur in association with this site:

SITE NUMBER: 028AY318UT
SITE NAME: UPLAND SHALLOW LOAM (BLACK SAGEBRUSH)

SITE NUMBER: 028AY320UT
SITE NAME: UPLAND SHALLOW HARDPAN (SINGLELEAF PINYON-UTAH JUNIPER)

SITE NUMBER: 028AY338UT
SITE NAME: UPLAND STONY LOAM (SINGLELEAF PINYON-UTAH JUNIPER)

SITE NUMBER: 028AY418UT
SITE NAME: MOUNTAIN LOAM (BIGTOOTH MAPLE)

XII. LIVESTOCK VALUES

THIS SITE IS SUITED FOR CATTLE AND SHEEP GRAZING DURING SPRING, SUMMER, AND FALL.

GRAZING SUITABILITY IS FAIR BECAUSE OF LOW FORAGE PRODUCTION IN THE UNDERSTORY.

XIII. WOOD PRODUCT VALUES

POTENTIAL WOOD PRODUCTS ARE POST, FUEL, CHRISTMAS TREES, AND NUTS

XIV. WILDLIFE SPECIES LIST

a. Site factors influencing wildlife species:

THIS SITE PROVIDES FOOD AND COVER FOR WILDLIFE.

b. Guide to site use by selected wildlife species:

WILDLIFE USING THIS SITE INCLUDE RABBIT, COYOTE, SAGE GROUSE, PRONGHORN ANTELOPE, MULE DEER, AND ELK.

XV. WATERSHED VALUES

THE SOILS ARE IN HYDROLOGIC GROUP D WITH RUNOFF CURVES RANGING FROM 80 TO 89 DEPENDING ON HYDROLOGIC CONDITION.

XVI. RECREATION AND NATURAL BEAUTY VALUES

RESOURCES THAT HAVE SPECIAL AESTHETIC AND LANDSCAPE VALUE ARE WILDFLOWERS. SOME RECREATION USES OF THIS SITE ARE HUNTING, HIKING, AND PICKNICKING.

RANGE SITE NAME: UPLAND SHALLOW LOAM (UTAH JUNIPER- SINGLEAF PINYON)
RANGE SITE NUMBER: 028AY324UT

XVII. THREATENED AND ENDANGERED PLANTS

THIS SECTION WILL BE ADDED AS INFORMATION IS AVAILABLE.

XVIII. ARCHAEOLOGICAL VALUES

THIS SECTION WILL BE ADDED AS INFORMATION IS AVAILABLE.

RANGE SITE NAME: UPLAND SHALLOW LOAM (UTAH JUNIPER- SINGLEAF PINYON)
RANGE SITE NUMBER: 028AY324UT

APPENDIX I

Reference Data

1. Site Documentation (number and kind of site inventory records)

0	SCS-ECS-5	24	STATE-ECS-FORM
34	SCS-RANGE-417	0	BLM FORM
0	OTHER		

2. Distribution and extent.

County	State
LOGAN FO	UTAH
PROVO FO	UTAH
CEDAR CITY FO	UTAH
MIDVALE FO	UTAH
RICHFIELD FO	UTAH

3. Location of typical example of this site.

SE 1/4 OF THE SW 1/4 SEC. 36 T. 15S. R. 2 W. JUAB CO. UTAH, MAP 87, P-6, PF14-4 WARM SPRINGS SOIL SURVEY, NEEDLE RANGE- BEAVER, CO.

Approved by: [signature] 8/30/93
STATE RANGE CONSERVATIONIST
SCS UTAH

Approved by: [signature]
WNTC RANGE CONSERVATIONIST
SCS / WNTC, PORTLAND, OR

RANGE SITE NAME: UPLAND SHALLOW LOAM (UTAH JUNIPER- SINGLEAF PINYON)
RANGE SITE NUMBER: 028AY324UT

APPENDIX II

1. Soil taxonomic unit representative of this site:

Soil Taxon

AMTOFT ST-L, MOIST

Soil Survey Area Number

608

Taxonomic Classification

LOAMY-SKELETAL, CARBONATIC MESIC LITHIC XEROLLIC CALCIORTHID

2. Type location for soils taxonomic unit representative of this site:

SE 1/4 OR THE SW 1/4 SEC. 36 T. 15S. R. 2 W. JUAB CO.

3. Listing of soils correlated to this site:

Soil Taxon.....: LODAR GRV-L
SSA.....: 601
Classification: LOAMY-SKELETAL, CARBONATIC MESIC LITHIC CALCIXEROLLS

Soil Taxon.....: LUNDY GRV-L
SSA.....: 601
Classification: LOAMY-SKELETAL, CARBONATIC FRIGID LITHIC CALCIXEROLLS

Soil Taxon.....: REYWAT CBV-L
SSA.....: 611
Classification: LOAMY-SKELETAL,MIXED,MESIC,LITHIC ARGIXEROLLS

Soil Taxon.....: PIOCHE
SSA.....: 634
Classification: CLAYEY-SKELETAL,MONTMORILLONITIC, MESIC, LITHIC ARGIXEROLL

Exhibit C

VARIANCE REQUEST

HIGH WALL VARIANCE REQUEST

FOR LEHI QUARRY

The mine plan envisions initial forty-foot hilltop limestone ore extraction proceeding in layers. Once the mining operations reach the permit boundary, then pit mining will occur in forty-foot benches from south to north in accordance with MSHA requirements. Extensive geological investigations and mapping of bedrock in this area indicate the bedding planes of bedrock dip approximately 30 degrees from the north to the northeast. By mining from the south to the north, a stable vertical wall will exist.

Our extensive experience in developing mine plans for clients throughout the country in similar geological formations substantiates the mining methodology to be employed at this site. We do hereby certify the structural stability of vertical to near-vertical walls under the mining methodology proposed.

Cyrus W. Wiser, Jr., P.E.

Exhibit D

MAPS